

**TBPOC CONFERENCE CALL
April 5, 2013, 11:00am – 12:00pm**

Topic		Presenter	Time	Desired Outcome
1. CHAIR'S REPORT		S. Heminger, BATA		Information
2. SAN FRANCISCO-OAKLAND BAY BRIDGE UPDATES				
a. Status Update on Anchor Rods		T. Anziano, CT	30 min	Information
b. Testing Protocol*		T. Anziano, CT	15 min	Approval
c. Communications Plan*		A. Gordon, BATA	15 min	Approval
3. OTHER BUSINESS				
Next TBPOC Conference Call: April 11, 2013, 3:00pm – 4:00pm				

* Attachments

** Attachments at end of binder

*** Attachments to be sent under separate cover

ITEM 1: CHAIR'S REPORT

No Attachments

Memorandum

TO: Toll Bridge Program Oversight Committee **DATE:** April 5, 2013
(TBPOC)

FR: Tony Anziano, Toll Bridge Program Manager, CT

RE: Agenda No. - 2a
San Francisco-Oakland Bay Bridge Updates
Item- Status Update on Anchor Rods

Recommendation:

For Information Only

Cost:

N/A

Schedule Impacts:

N/A

Discussion:

A verbal update on the recent failure of some anchor rods on the bridge will be provided at the TBPOC April 5 conference call.

Attachment(s):

N/A

Memorandum

TO: Toll Bridge Program Oversight Committee (TBPOC) **DATE:** April 5, 2013

FR: Tony Anziano, Toll Bridge Program Manager, CT

RE: Agenda No. - 2b
San Francisco-Oakland Bay Bridge Updates
Item- Testing Protocol

Recommendation:
APPROVAL

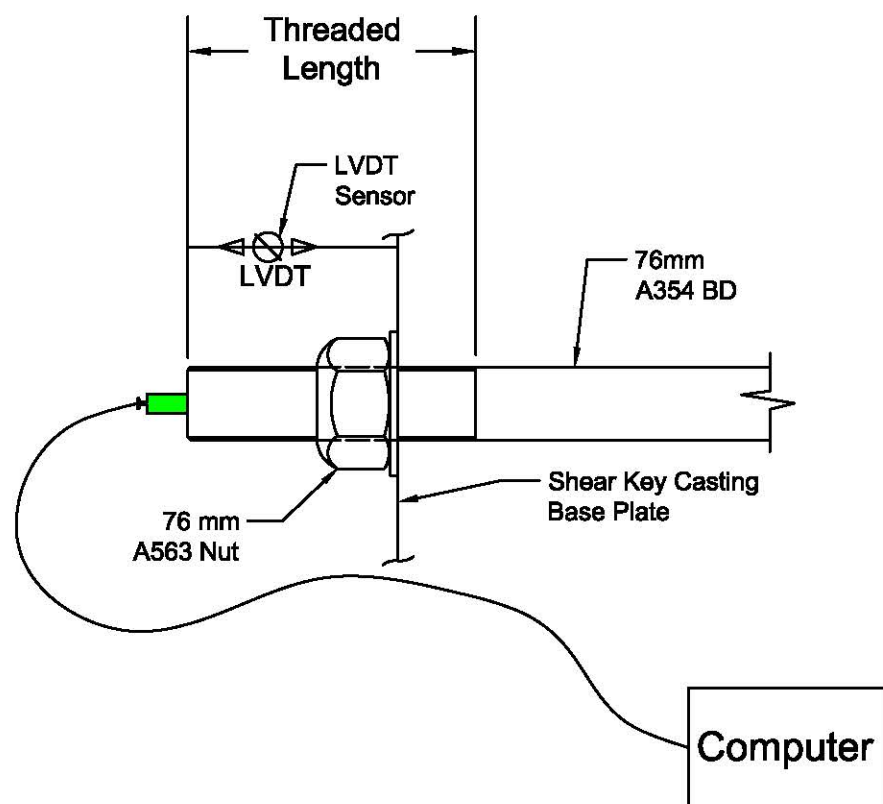
Cost:
N/A

Schedule Impacts:
N/A

Discussion:
See attachments.

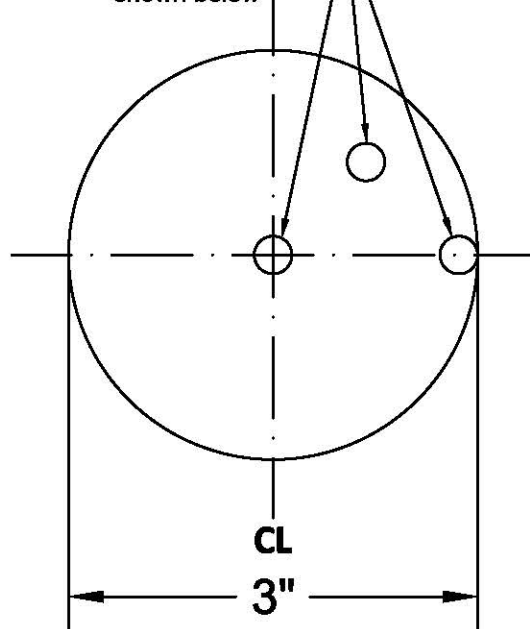
Attachment(s): 4

1. LOCATIONS WHERE ROD REMOVAL ALREADY OCCURRED (S1, 7A AND 1G; S2, 6A AND 6H)
 - A. DOCUMENT 2 LOCATIONS WHERE BORESCOPE EVALUATION HAS ALREADY OCCURRED
 - B. EVALUATE AND DOCUMENT ALL 4 REMOVED RODS FOR EVIDENCE OF CORROSION
 - C. COMPLETE BORESCOPE EVALUATION AT REMAINING 2 LOCATIONS
 - D. IF WATER IS OBSERVED DURING BORESCOPE EVALUATION IN C ABOVE, RECORD PRESENCE AND SAMPLE AND TEST WATER (CHLORIDES)
 - E. CONDUCT DESTRUCTIVE TESTING ON ADDITIONAL SAMPLE FROM ROD ALREADY SUBJECTED TO ELETRON MICROSCOPY AND DESTRUCTIVE TESTING. PREPARE COMPREHENSIVE REPORT INCLUDING ALL THREE STEPS.
 - F. CONDUCT DESTRUCTIVE TESTING ON ONE ADDITIONAL REMOVED ROD UTILIZING SAME STEPS AS IN E ABOVE.
2. REMAINING RODS AT S3, S4, AND B1-B-6: SEE ATTACHED PROTOCOL
3. ROD REMOVAL AT S1 AND S2
 - A. REMOVE ALL REMAINING RODS
 - B. RECORD LAST KNOWN TENSION PRIOR TO REMOVAL
 - C. MAINTAIN TRACEABILITY OF ROD SECTIONS
 - D. STORE RODS IN SECURE AREA IN WAREHOUSE.
 - E. USE BORESCOPE TO EVALUATE PRESENCE/ABSENCE OF WATER IN ROD HOLE
 - F. IF WATER IS PRESENT, RECORD PRESENCE AND SAMPLE AND TEST WATER (CHLORIDES)
 - G. BASED ON RESULTS FROM TESTING IN 1 AND 2 ABOVE, DETERMINE IF ANY ADDITIONAL DESTRUCTIVE TESTING IS OF USE



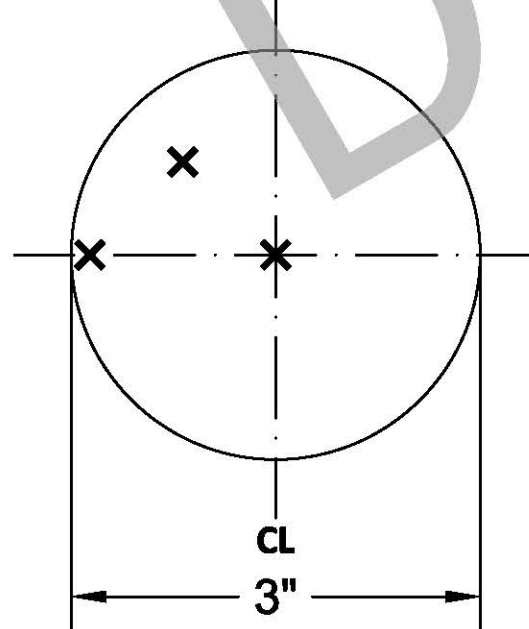
Anchor Rod Testing
(Test Setup)

Perform tensile tests
Three 505 Samples as
shown below



Section A

NTS - Sample as close to the
fractured surface as practical.



Section B

NTS - Sample as close to the
fractured surface as practical.

Bay Bridge Anchor Rod Testing (192 Rods)

Sample Selection:

1. In-Situ testing shall be performed on all 192 anchor rods as described below.
2. Select 10 different rods for extended testing. 10 rod sample size (~ 5%) is larger than ASTM F1470 requirements of 7 bars for lot size of 151 to 280 rods.

In-Situ Testing Protocol:

1. Mark the rods selected for extended testing to identify the jacking end.
2. Install acoustic measuring devices on each of the 10 sample rods selected for extended testing.
3. Load all 192 rods up to 0.75Fu (with seating loss expected to bring the final tension in the rods down to the Design load of 0.7Fu).
4. Maintain the applied load for 30 days, during which all rods will be visually inspected daily, checking for failures.
5. METS will monitor the acoustic measuring output on the 10 rods selected for the extended testing.
6. If any rod (of the total lot of 192 rods) fails prior to the 30 day testing period, extract and perform post fracture analysis as detailed below under "Extended Testing Protocol".
7. If no rods fail within the 30 day period, extract the 10 sample rods, transport to a testing facility/load bed.

Extended Testing Protocol:

(Tests listed below to be performed at an independent testing laboratory accredited per ISO 17025 or approved by Caltrans).

1. Load the 10 samples to failure. The rods shall be jacked at the same ends as they were jacked during the in-situ testing.
2. Perform Charpy V-Notch testing of broken rods at room temperature and at 40 degrees F.
3. Perform reduced section tensile tests (.505 diameter) of the broken rods as close to the fracture surface as possible. Tensile tests to be performed as detailed in Section A.
4. Perform hardness Testing (Rockwell C and Knoop Micro-hardness) of broken rods.
5. Perform chemical analysis of broken rods at the threaded area and at the shank. Chemical tests to be performed as detailed in Section B.
6. Perform scanning electron microscopy - examination of fracture features on broken rods.
7. Perform Micro-structural examination of broken rods at the threaded area.

Note: It is expected that loading of the 192 bolts for 30 days will allow any existing hydrogen atoms to propagate in between the grain boundaries of the steel. Therefore, even if the bolts do not fail within the 30 day period, the scanning electron microscopy will provide sufficient information necessary to determine presence of Hydrogen.

	Revision No:	By:	Date:	SELF-ANCHORED SUSPENSION BRIDGE			
				E2 Bearings & Shear Keys - Testing Protocol			
				Drawn By:	BD	SHEET NUMBER	SK-01
				Date:	4/1/2013		

1. Put the contractor on notice in writing that they need to demonstrate that they are in compliance with contractual requirements and secure their proposed course of action.

Status: To be discussed in executive session as a contract administration matter.

2. Initiate and conclude a complete forensic analysis to determine to the greatest extent possible the cause of the failures.

Status: This has been underway for at least 3 weeks and is anticipated to be ongoing for at least another 6 weeks.

3. In addition to material evaluations, determine the forces to which these rods were subjected to at time of failure.

Status: Rods were jacked to 105 KSI, which resulted in a final stress of 98 KSI (the stress reduces slightly after jacking is complete and jacks are removed), or 70% or the specified tensile strength of the rod.

4. It is my understanding that rods associated with shear key 1 and 2 were installed in 2008, and the remaining shear key and bearing rods were installed in 2010. Also, that the failures thus far are all associated with the 96 rods installed in 2008 for shear key 1 and 2. Determine definitively the manufacturers and suppliers involved in delivering the rods to the job site for all rods installed.

Status: The present issue involves high strength rods installed at the cap beam of Pier E-2 that are classified as ASTM (American Society for Testing and Materials) A354BD. All A354BD rods supplied for Pier E-2 were supplied by the Dyson Corporation. In addition, to address potential public questions and concern, we are assessing all other A354BD high strength rods installed on the SAS at other locations (other than E-2), all of which were supplied by Dyson. Other bolts, classified as ASTM354BC and 34CrNiMo6QT were supplied by Dyson, the Portland Bolt and Manufacturing Company and Goodwin Steel. These other bolts are unlikely to be susceptible to hydrogen embrittlement or other hydrogen related causal factors, the suspected cause of the E-2 bolt fractures. This may be modified based on the conclusion of 2 above and 6 and 7 below.

5. Articulate the testing and compliance certification process employed during construction to fulfill Quality Control/Quality Assurance efforts.

Status: Since the fractures in question are occurring in the rods, the focus of this response is on the rods. All 96 rods installed for shear keys 1 and 2 were manufactured in 2008. Quality control steps for these rods included the following: steel mill certification of chemical composition, independent laboratory testing of mechanical properties (yield, strength, elongation, reduction of area) of mill stock, independent laboratory testing of mechanical properties post heat treatment, and mill readings of galvanization thickness. Certifications of compliance were provided by Dyson. Quality assurance testing was performed by the Department's materials Engineering and Testing Services and included the following: pre-fabrication audits of all facilities involved in fabrication, regular inspection of facilities during fabrication, and in-house laboratory testing of mechanical properties post heat treatment and post-galvanization. Out of the 156 results obtained from both quality control and quality assurance testing; only 5 results were below specifications. All 5 involved on mechanical property – elongation. The specification requires a minimum of 14% elongation, and 5 results

were in the range of 12.5-13.6%, or 1.5-0.4% below specification. These results were reviewed by design and construction and the material was determined to be suitable for use.

6. Subject the broken rods to subsequent testing to help ascertain failure cause.

Status: One broken rod has already been subjected to 2 destructive tests, including electron microscopy. Additional destructive testing is proposed for 1 additional broken rod.

7. Subject representative group of rods installed in 2010 and not yet tensioned to testing to analyze for adequate strength and properties.

Status: A draft testing plan has been developed for TBPOC review and is being submitted for TBPOC review with this update report..

8. Identify any other components of the bridge that came from the same manufacturer or supplier and re-inspect.

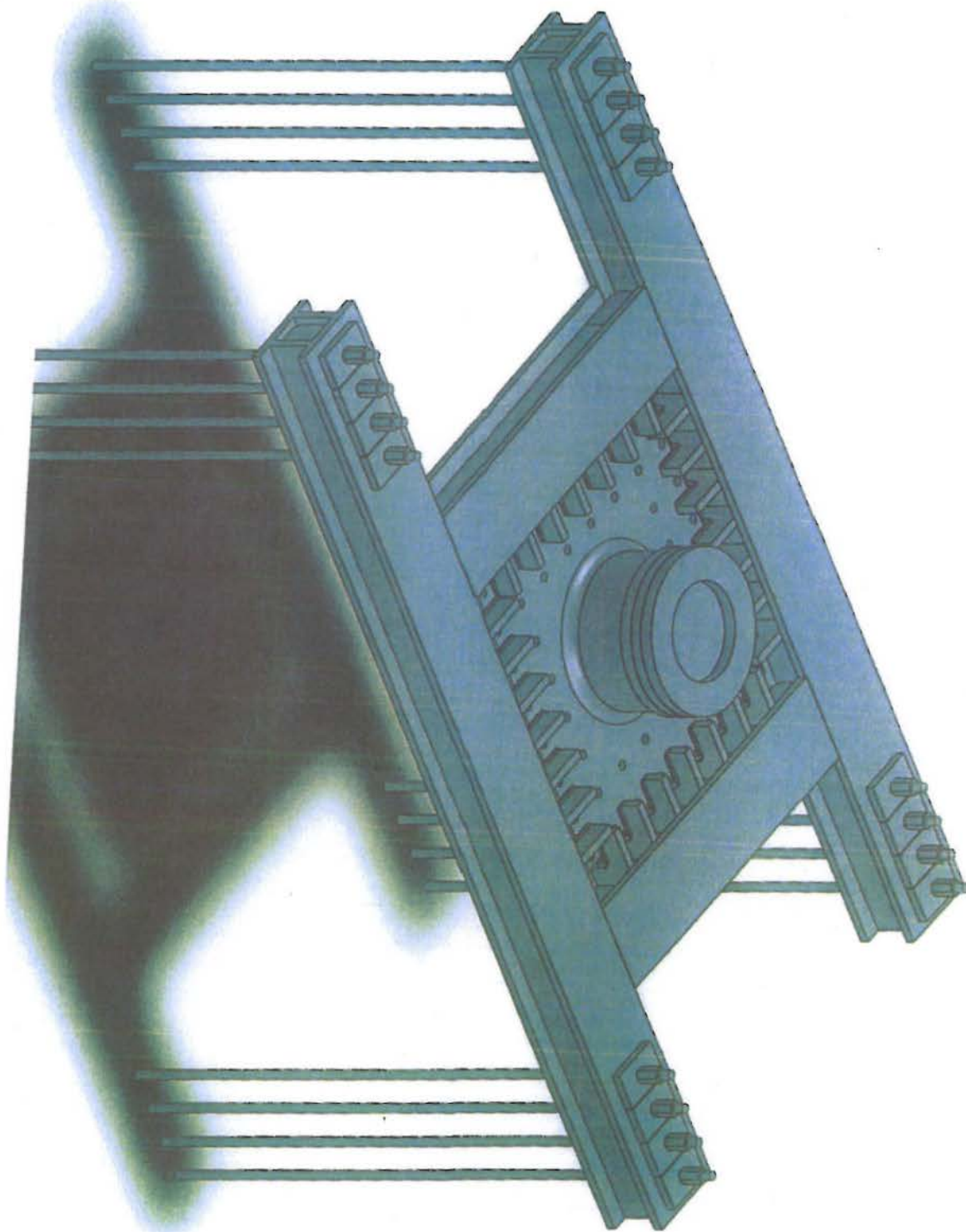
Status: We will conduct a complete visual inspection of all Dyson high strength rods, including both A354BD and A354BC rods and bolts, and prepare a report of this inspection. Also see status under 4 above.

9. Once the design and construction team selects a preferred solution, present to the Toll Bridge Program Oversight Committee for approval.

Status: Daily discussions have been ongoing between the prime contractor, the design joint venture and Department staff regarding development of a design solution for the S1 and S2 shear key attachments. A final design is weeks away, but focus is currently on a steel collar alternative secured to the cap beam with high strength rods that fully penetrate the cap beam.

10. Once approved, develop cost and schedule impacts of implementing solution.

Status; As requested, this will occur once a final design has been developed and priced.



TO: Toll Bridge Program Oversight Committee **DATE:** April 5, 2013
(TBPOC)

FR: Andrew Gordon, Bay Bridge Spokesperson, BATA

RE: Agenda No. - 2c
San Francisco-Oakland Bay Bridge Updates
Item- Anchor Rod Communications Plan

Recommendation:
APPROVAL

Cost:
N/A

Schedule Impacts:
N/A

Discussion:

As media and public interest grows in the situation surrounding the E2 anchor rods, so does the potential for misinformation and doubt without a plan to distribute information. Currently, some media outlets are receiving information that others are not, and media are receiving information from different sources.

The following proposed elements would provide greater transparency, a steady flow of news at expected intervals, and consistency of information. By setting expectations for information and opportunities for the media to ask questions, the Public Information Office (PIO) will be able to aggregate media inquiries, making it more efficient and effective to respond.

At the BATA Oversight Committee meeting on April 10, it is recommended that the TBPOC announce to assembled media that the test reports are available online and provide a limited number of printed copies as well, and make program management available to speak to the media following the meeting. Simultaneously, the PIO will distribute a media advisory alerting all media to the reports and a media availability at the PIO in the afternoon, allowing the media to ask questions after reviewing the reports. If the BATA Oversight Committee is to receive information about the testing

protocol for the remaining rods, as well as the list of other components provided by Dyson, those should be made available to the media as well.

Once it has been established how long it will take to test the other rods as well as the other components provided by Dyson, regular updates (e.g. weekly) should be provided to the media.

Similarly, once a proposed solution for securing the shear keys in place has been approved and announced, regular updates should be provided as well throughout the fabrication, testing and installation process.

PMT members and others currently receive Day Ahead Reports (DARs) that highlight the day's media activity and upcoming media coverage. It is recommended that TBPOC members be added to this distribution list.

Attachment(s):

N/A

ITEM 3: OTHER BUSINESS

No Attachments